

Notice of Allowability

Application No.

09/985,853

Examiner

Matthew J. Sked

Applicant(s)

OZAWA, KAZUNORI

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 08/09/05.
2. ☒ The allowed claim(s) is/are 1-14.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

W. R. YOUNG
PRIMARY EXAMINER

DETAILED ACTION

Response to Arguments

1. In view of the Applicant's arguments, enclosed is a fully signed copy of the IDS filed on 01/08/04.
2. The objection to claim 13 is withdrawn in view of the amendments filed 08/09/05.
3. The rejection to claims 1, 6, 8 and 13 under 35 USC 112 is withdrawn in view of the amendments filed 08/09/05.
4. Applicant's arguments, filed 08/09/05, with respect to claims 1 and 12 have been fully considered and are persuasive. The rejection of claims 1-5 and 8-12 has been withdrawn.

Allowable Subject Matter

5. Claims 1-14 are allowed.
6. The following is an examiner's statement of reasons for allowance: Claims 1 and 8 recite the combination of decoding a coded speech signal comprising a spectral parameter calculating circuit for calculating the spectral parameters from the coded signal, an excitation signal calculating circuit for calculating the excitation signal from the coded signal and the spectral parameters, a smoothing circuit responsive to both the excitation signal and the spectral parameters for smoothing either the excitation signal or the spectral parameters, a synthesis filter constructed with the spectral parameters output from the smoothing circuit for synthesizing the excitation signal and

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wherein the excitation signal calculating circuit, the smoothing circuit and the synthesis filter circuit operate in compliance with predetermined conditions.

Paksoy teaches a speech decoder for decoding a coded speech signal into a reproduction speech signal and for reproducing a speech signal using the reproduction speech signal, including:

a spectral parameter calculating circuit, responsive to the reproduction speech signal, for calculating spectral parameters based on the reproduction speech signal (decodes LP coefficients from the decoded highband code bits, paragraph 67 and Fig. 1c);

an excitation signal calculating circuit for calculating an excitation signal and for obtaining a level of the excitation signal, on the basis of the reproduction speech signal and the spectral parameters calculated by the spectral parameter calculating circuit (generates the highband pitch-modulated excitation waveform from the LP coefficients, paragraph 69 and Fig. 1c);

a smoothing circuit for smoothing in time the level of the excitation signal (smoothes the excitation waveform depending on a smoothing factor, paragraphs 63-66 and 69); and

a synthesis filter circuit having a synthesis filter constructed with the spectrum parameters, and for synthesizing the excitation signal by using the synthesis filter, so as to reproduce the speech signal (synthesizes the smoothed excitation using the LP coefficients, paragraph 72);

wherein the excitation signal calculating circuit, the smoothing circuit and the synthesis filter circuit operate in compliance with only predetermined conditions (the excitation, smoothing and synthesizing only operate on highband signals, paragraphs 67-72).

None of the prior art on record teaches the smoothing circuit being responsive to both the spectral parameters and the excitation signal or the synthesis filter is constructed with the spectral parameters output from the smoothing circuit. It would not have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Paksoy to arrive at the Applicant's invention.

Claims 6 and 13 recite the combination of a calculating the spectral parameters of the reproduction speech signal, calculating an excitation signal from the spectral parameters and the reproduction speech signal, calculating a residual signal from by subtracting a pitch prediction signal, calculated from the pitch period, from the excitation signal, calculating the gain of the pitch prediction signal or residual signal, smoothing the spectral parameters or the gain and outputting both and synthesizing a new excitation signal from the excitation signal, gain, pitch prediction signal and residual signal.

Ehara teaches a speech decoder for decoding a coded speech signal into a reproduction speech signal and for reproducing a speech signal by the use of the reproduction speech signal, including:

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a spectral parameter calculating circuit, responsive to the reproduction speech signal, for calculating spectral parameters based on the reproduction speech signal (LPC decoder determines the LPCs from the demultiplexed code, paragraph 44);

an excitation signal calculating circuit for calculating an excitation signal and for obtaining a level of the excitation signal, on the basis of the reproduction speech signal and the spectral parameters calculated by the spectral parameter calculating circuit (generates a random codebook vector based upon the input code and the mode determined by the spectral parameters, paragraph 45 and 46);

a pitch-prediction circuit which calculates a pitch period from either the reproduction speech signal or the excitation signal, carries out a pitch prediction by the use of pitch period to produce a pitch prediction signal (generates an adaptive code vector by decoding the demultiplexed adaptive codebook index, paragraph 47), suggests calculating a residual signal by subtracting the pitch prediction signal from the excitation signal (adds the adaptive code vector and random code vector which would mathematically similar to subtraction, paragraph 49);

a gain-calculating circuit (gain codebook, paragraph 48); and

a synthesis filter circuit having a synthesis filter constructed with the spectrum parameters (paragraph 50) and for newly producing an excitation signal as a proper excitation signal on the basis of the gain, the pitch prediction signal and the residual signal, and thereby for synthesizing the proper excitation signal by using the synthesis filter, so as to reproduce the speech signal (paragraph 50).

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Ehara does not teach a gain-calculating circuit for calculating a gain of at least one of the pitch prediction signal and the residual signal both output from the pitch-prediction circuit and a smoothing circuit responsive to the spectral parameters and the gain, for smoothing in time at least one of the spectral parameters and the gain, so as to output the spectral parameters and the excitation signal where at least one is subjected to smoothing.

Hayata (U.S. Pat. 5,787,388) teaches a decoding system with a smoothing unit for smoothing the spectral parameters but does not teach the smoothing unit is responsive to both spectral parameters and gain and does not teach a gain calculating circuit.

Kroon et al. (U.S. Pat. 5,732,389) teaches a decoding system with a gain calculating unit that calculates the gain of the signal from the excitation signal using a predicted pitch delay (compute gain from residual signal, col. 30, lines 2-5 and lines 30-33) but does not teach a smoothing unit responsive to the gain and spectral parameters.

It would not have been obvious to one of ordinary skill in the art at the time of invention to modify the systems given in order to arrive at the applicant's invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Murashima (U.S. Pat. 6,910,009) teaches a speech decoder that smoothes the gain based on the LSP parameters and uses a combination of the pitch signal and excitation for synthesis.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Sked whose telephone number is (571) 272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



W. R. YOUNG
PRIMARY EXAMINER

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10/18/05